

dc-249006 FORM PTO-1390
TRADEMARK OFFICE
(REV 11-2000)

U.S. DEPARTMENT OF COMMERCE PATENT AND

ATTORNEY'S DOCKET NUMBER

449122002000

U.S. APPLICATION NO. (If known, see 37 CFR

09/762472

Not yet Assigned

INTERNATIONAL APPLICATION NO.
PCT/EP99/04626

INTERNATIONAL FILING DATE

2 July 1999

PRIORITY DATE CLAIMED

7 August 1998

TITLE OF INVENTION

METHOD FOR OPERATING A TERMINAL UNIT IN A TELEPHONE EXCHANGE

APPLICANT(S) FOR DO/EO/US

Michael EDER et al.

Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:

1. ☒ This is a **FIRST** submission of items concerning a filing under 35 U.S.C. 371
2. ☐ This is a **SECOND** or **SUBSEQUENT** submission of items concerning a filing under 35 U.S.C. 371.
3. ☐ This is an express request to begin national examination procedures (35 U.S.C. 371(f)). The submission must include items (5), (6), (9) and (21) indicated below
4. ☒ The US has been elected by the expiration of 19 months from the priority date (PCT Article 31)
5. ☒ A copy of the International Application as filed (35 U.S.C. 371(c)(2))
 - a. ☒ is attached hereto (required only if not communicated by the International Bureau).
 - b. ☒ has been communicated by the International Bureau
 - c. ☐ is not required, as the application was filed in the United States Receiving Office (RO/US).
6. ☒ An English language translation of the International Application under PCT Article 19 (35 U.S.C. 371(c)(2)).
 - a. ☒ is attached hereto.
 - b. ☐ has been previously submitted under 35 U.S.C. 154(d)(4).
7. ☒ Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371(c)(3))
 - a. ☐ are attached hereto (required only if not communicated by the International Bureau).
 - b. ☒ have been communicated by the International Bureau.
 - c. ☐ have not been made; however, the time limit for making such amendments has NOT expired
 - d. ☐ have not been made and will not be made
8. ☐ An English language translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371(c)(3)).
9. ☐ An oath or declaration of the inventor(s) (35 U.S.C. 371(c)(4)).
10. ☐ An English language translation of the annexes to the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371(c)(5))

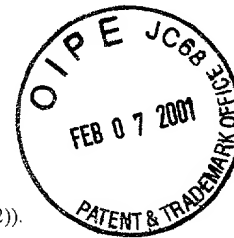
Items 11. to 16. below concern document(s) or information included:

11. ☒ An Information Disclosure Statement under 37 CFR 1.97 and 1.98.
12. ☐ An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included
13. ☒ A **FIRST** preliminary amendment.
14. ☐ A **SECOND** or **SUBSEQUENT** preliminary amendment
15. ☐ A substitute specification.
16. ☐ A change of power of attorney and/or address letter
17. ☐ A computer-readable form of the sequence listing in accordance with PCT Rule 13ter 2 and 35 U.S.C. 1.821 - 1.825.
18. ☐ A second copy of the published international application under 35 U.S.C. 154(d)(4).
19. ☐ A second copy of the English language translation of the international application under 35 U.S.C. 154(d)(4)
20. ☒ Other items or information 1. Translation of International Application 2. IPR including Amended Sheets and Translation of Amended Sheets 3. Transmittal of Intl' Search Report 4. Return receipt postcard

CERTIFICATE OF HAND DELIVERY

I hereby certify that this correspondence is being hand filed with the United States Patent and Trademark Office in Washington, D.C. on February 7, 2001.

LaVonne Whetstone

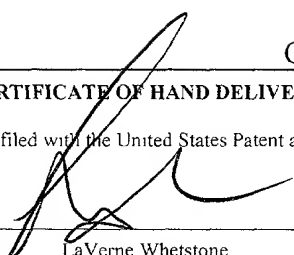


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|---|--------------|--|------------|---------------------------------------|----|
| U.S. APPLICATION NO. (if known, see 37 CFR 1.53) <div style="font-size: 2em; font-weight: bold; margin-left: 100px;">09/762472</div> | | INTERNATIONAL APPLICATION NO. PCT/EP99/04626 | | ATTORNEY'S DOCKET NUMBER 449122002000 | |
| 21. <input checked="" type="checkbox"/> The following fees are submitted: | | | | | |
| - BASIC NATIONAL FEE (37 CFR 1.492(a)(1)-(5)): | | | | | |
| - Neither international preliminary examination fee (37 CFR 1.482) nor international search fee (37 CFR 1.445(a)(2)) paid to USPTO and International Search Report not prepared by the EPO or JPO \$1,000.00 | | | | | |
| International preliminary examination fee (37 CFR 1.482) not paid to USPTO but International Search Report prepared by the EPO or JPO \$860.00 | | | | | |
| International preliminary examination fee (37 CFR 1.482) not paid to USPTO but international search fee (37 CFR 1.445(a)(2)) paid to USPTO \$710.00 | | | | | |
| International preliminary examination fee (37 CFR 1.482) paid to USPTO but all claims did not satisfy provision of PCT Article 33(1)-(4) \$690.00 | | | | | |
| International preliminary examination fee (37 CFR 1.482) paid to USPTO and all claims satisfied provisions of PCT Article 33(1)-(4) \$100.00 | | | | | |
| ENTER APPROPRIATE BASIC FEE AMOUNT = | | | | \$860.00 | |
| Surcharge of \$130.00 for furnishing the oath or declaration later than <input type="checkbox"/> 20 <input type="checkbox"/> 30 months from the earliest claimed priority date (37 CFR 1.492(e)). | | | | \$0 | |
| CLAIMS | NUMBER FILED | NUMBER EXTRA | RATE | \$0 | |
| Total claims | 11 - 20 = | 0 | x \$18.00 | \$0 | |
| Independent claims | 1 - 3 = | 0 | x \$80.00 | \$0 | |
| MULTIPLE DEPENDENT CLAIM(S) (if applicable) | | | + \$270.00 | \$0 | |
| TOTAL OF ABOVE CALCULATIONS = | | | | \$860.00 | |
| <input type="checkbox"/> Applicant claims small entity status. See 37 CFR 1.27. The fees indicated above are reduced by 1/2. | | | | \$0 | |
| SUBTOTAL = | | | | \$860.00 | |
| Processing fee of \$130.00 for furnishing the English translation later than <input type="checkbox"/> 20 <input type="checkbox"/> 30 months from the earliest claimed priority date (37 CFR 1.492(f)). | | | | \$0 | |
| TOTAL NATIONAL FEE = | | | | \$860.00 | |
| Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31). \$40.00 per property | | | | \$0 | |
| TOTAL FEES ENCLOSED = | | | | \$860.00 | |
| | | | | Amount to be refunded: | \$ |
| | | | | charged: | \$ |
| a. <input checked="" type="checkbox"/> A check in the amount of \$ 860.00 to cover the above fees is enclosed. b. <input checked="" type="checkbox"/> The Commissioner is hereby authorized to charge any additional fees that may be required, or credit any overpayment to Deposit Account No. 03-1952. | | | | | |
| NOTE: Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (37 CFR 1.137(a) or (b)) must be filed and granted to restore the application to pending status. | | | | | |
| SEND ALL CORRESPONDENCE TO: Kevin R. Spivak Morrison & Foerster LLP 2000 Pennsylvania Avenue, N.W. Washington, D.C. 20006-1888 | | | | | |
| <div style="display: flex; align-items: center;"> <div> Reg. No. 36,119 SIGNATURE Kevin R. Spivak Registration No. 43,148 </div> </div> | | | | | |

Docket No. 449122002000
Client Reference 1998P02267WOUS

CERTIFICATE OF HAND DELIVERY

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February 7, 2001


LaVerne Whetstone

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In the application of:

Michael EDER et al.

Serial No.: Not yet Assigned

Filing Date: February 7, 2001

For: METHOD FOR OPERATING A
TERMINAL UNIT IN A TELEPHONE
EXCHANGE

Examiner: To be Assigned

Group Art Unit: To be Assigned

PRELIMINARY AMENDMENT

Commissioner for Patents
Washington, D.C. 20231

Sir:

Prior to examination on the merits, please amend this application as follows:

IN THE SPECIFICATION

Please amend the specification as follows.

Page 1, line 1, delete "Description";

line 2, center and capitalize the title --METHOD FOR OPERATING A
TERMINAL UNIT IN A TELEPHONE EXCHANGE--;

Page 1, line 36, delete "the" and replace with --a--.

Page 1, lines 2-5, delete "Method for operating a terminal unit in an exchange by means of a message interface between signaling and control programs, and terminal units used in the method".

Page 2, between lines 3 and 4, insert the following:

--International patent application WO 93/00776 describes a software system for a software-controlled switching device. This switching device has a plurality of telecommunications control modules and a plurality of telecommunications resources modules. Each telecommunications resources module has software for bringing in a range of additional functions which are configured for providing telecommunications services for partial applications, without taking account of the configuration of other applications. Each telecommunications resources module carries out common services which are required by two or by more control modules.

Furthermore, the switching device has means for providing communications connections between the telecommunications control modules. Each of these communications connections has network protocols for exchanging information without any control module taking account during exchange of information of the presence of a further control module with which it communicates in the same exchange.--

Page 2, between lines 3 and 4, insert --SUMMARY OF THE INVENTION--.

line 17, insert --two application programs-- after the word "Separating".

line 19, delete "into two application programs".

delete "statuses" and replace with --states--.

line 27, delete "usually".

line 6, insert --FIELD OF THE INVENTION--; and

between lines 27 and 28, insert --BACKGROUND OF THE INVENTION--.

Page 2, line 4, delete "object" and insert --aspect--.

Page 2, line 10, delete "object" and insert --aspect of the invention--.

Page 4, above line 1, insert --BRIEF DESCRIPTION OF THE DRAWINGS--;
 between line 11 and line 12, insert --DETAILED DESCRIPTION OF THE
INVENTION--.

IN THE ABSTRACT

Please replace the Abstract in its entirety with the Abstract attached hereto.

IN THE CLAIMS

Please amend the claims as follows.

1. (Amended) A method for operating a terminal unit [(12)] in an exchange [(10)], in which signaling for a first subscriber [(TlnA1)] is carried out during execution of a first application program [(100)] by a processor [(58)] contained in the terminal unit [(12), method steps for] wherein call processing between the first subscriber [(TlnA1)] and a second subscriber [(TlnB1) are] is carried out during execution of a second application program [(110)], wherein signaling data [(200)], generated during signaling, at a message interface [(120)] are transferred to the second application program [(110)] by using an operating system [(BS)] for controlling the flow of the application programs [(100, 110)],

and[/or in which] wherein call data, generated during call processing [(110)], at the message interface [(120)] are transferred to the first application program [(100)] by using the operating system [(BS)].

2. (Amended) A method for operating a terminal unit [(16)] in an exchange [(10)], in which signaling is carried out with the aid of a further exchange [(26)] by a processor contained in the terminal unit [(16)] during execution of a first application program, [method steps for] wherein call processing between the two exchanges [(10, 26) are] is carried out during execution of a second application program, wherein signaling data [(200)], generated during signaling, at a

message interface are transferred to the second application program by using an operating system [(BS)] for controlling the flow of the application programs,

and[/or in which] wherein call data, generated during call processing, at the message interface are transferred to the first application program by using the operating system [(BS)].

3. (Amended) The method as claimed in claim 1 [or 2, characterized in that] wherein the generated signaling data [(200) and/]or the call data contain messages with a prescribed structure.

4. (Amended) The method as claimed in claim 3, [characterized in that] wherein the messages contain a receiver identifier [(206)],

[and/]or an address reference [(208)] on a data block [(202)] with data to be transmitted,
[and/]or a message identifier [(210)] for distinguishing the different messages,
[and/]or a message type identifier for identifying the type of message,
[and/]or data [(212, 214)] on the application program [(100, 110)] generating the message.

5. (Amended) The method as claimed in [one of the preceding claims, characterized in that] claim 1, wherein the signaling data [(200)] and/or the call data contain a data block [(202)],
and [in that] wherein, in addition to data [(222, 224)] to be transmitted, the data block preferably contains further data [(220)] with the aid of which the data block [(202)] can be assigned to one or more application programs [(100, 110)].

6. (Amended) The method as claimed in [one of the preceding claims, characterized in that at least] claim 1, wherein two first application programs [(100, 102)] are used for signaling with the aid of different protocols [(P1, P2)],

and [in that] wherein the first application programs exchange signaling data [(200)] and/or call data with second application programs [(110, 112)] via a common or a plurality of message interfaces [(120)],

and [in that] wherein the same command sequence is preferably executed during processing of the second application programs.

7. (Amended) The method as claimed in [one of claims 1 to 5, characterized in that at least] claim 1, wherein two second application programs with identical or different command sequences are used,

[in that] wherein the first application program exchanges signaling data and/or call data with the second application programs via a common or a plurality of message interfaces,

and [in that] wherein the same command sequence is preferably used in the case of second application programs with identical command sequences.

8. (Amended) A terminal unit [(12)] for an exchange [(10)], in particular for carrying out the method as claimed in claim 1 [or one of claims 1 to 7] comprising,

[having at least] one subscriber line [(50)] for connecting a first subscriber [(TlnA1)],

[having at least] one further connection [(64)] for setting up a transmission channel to a second subscriber [(TlnB1)],

[having] application programs [(100) to (114)] for executing switching operations, to which signaling at the subscriber line [(50)] and method steps for call processing belong,

[use being made of] wherein signaling data [(200)] generated during signaling is used when processing a call, [and] or call data generated during call processing is used when signaling,

and [having] further comprising an operating system [(BS)] controlling the flow of the application programs [(100 to 114)],

[characterized in that] wherein the signaling data [(200)] and/or the call data are transferred to [at least] one message interface [(120)] by using the operating system [(BS)].

9. (Amended) The terminal unit [(16)] for an exchange [(10)], in particular for carrying out the method as claimed in claim 2 [one of claims 2 to 7] comprising,

[having at least] one connection for connecting a further exchange [(26)],

[having] application programs for executing switching operations, to which signaling at the connection and method steps for call processing belong,

[use being made of] wherein signaling data [(200)] generated during signaling is used when processing a call, [and] or call data generated during call processing is used when signaling,

and [having] further comprising an operating system [(BS)] controlling the flow of the application programs,

[characterized in that] wherein the signaling data [(200)] and/or the call data are transferred to [at least] one message interface by using the operating system [(BS)].

10. (Amended) The terminal unit [(12, 16)] as claimed in claim 8 [or 9, characterized in that] wherein signaling is executed by a first application program [(100)], and [the method steps for] wherein call processing [are] is executed by a second application program [(110)].

11. (Amended) An exchange [(10)], [characterized by] comprising a terminal unit [(12, 16)] as claimed in claim 8 [one of claims 8 to 10].

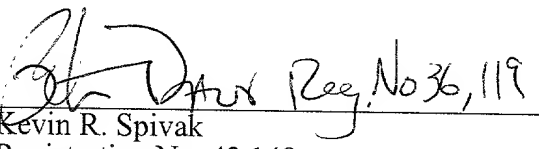
REMARKS

The above amendments to the specification, claims and abstract have been made to place the application in proper U.S. format and to conform with proper grammatical and idiomatic English. None of the amendments herein are made for reasons related to patentability. No new matter has been added.

In the event that the transmittal letter is separated from this document and the Patent Office determines that an extension and/or other relief is required, applicant petitions for any required relief including extensions of time and authorizes the Commissioner to charge the cost of such petitions and/or other fees due in connection with the filing of this document to Deposit Account No. 03-1952 referencing docket no. 449122001300. However, the Commissioner is not authorized to charge the cost of the issue fee to the Deposit Account.

Respectfully submitted,

Dated: February 7, 2001

By: 
for Kevin R. Spivak
Registration No. 43,148

Morrison & Foerster LLP
2000 Pennsylvania Avenue, N.W.
Washington, D.C. 20006-1888
Telephone: (202) 887-6924
Facsimile: (202) 887-0763

ABSTRACT

[An explanation is given of a] A method for operating an exchange, in which signaling is carried out at a subscriber line for connecting a first subscriber (TlnA1) during execution of a first application program (100). [Method steps] A method for call processing between the first subscriber (TlnA1), and a second subscriber (TlnB1) [are carried out] during execution of a second application program (110). A message interface (120) during the use of which an operating system (BS) of the terminal unit is incorporated is used for the purpose of transfer between the two application programs (100) and (110).

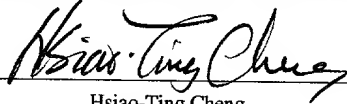
100-449122002000

Rec'd PCT/PTO 29 MAR 2001
PATENT

Docket No. 449122002000
Client Reference 1998P02267WOUS

CERTIFICATE OF HAND DELIVERY

I hereby certify that this correspondence is being hand filed with the United States Patent and Trademark Office in Washington, D.C. on March 29, 2001.


Hsiao-Ting Cheng

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In the application of:

Michael EDER et al.

Serial No.: 09/762,472

Filing Date: February 7, 2001

For: METHOD FOR OPERATING A
TERMINAL UNIT IN A TELEPHONE
EXCHANGE

Examiner: To be Assigned

Group Art Unit: To be Assigned

SECOND PRELIMINARY AMENDMENT

Commissioner for Patents
Washington, D.C. 20231

Sir:

Prior to examination on the merits, please amend this application as follows:

IN THE SPECIFICATION

Please amend the specification as follows.

On page 1 between the title and the first paragraph, please insert the following new paragraph:

This application claims priority to International Application No. PCT/EP99/04626 which was published in the German language on February 17, 2000.

IN THE DRAWINGS

Please amend the drawings according to the attached Amendment of Drawing Under 37 CFR Section 1.121.

REMARKS

The above amendments to the specification and drawings have been made to place the application in proper U.S. format and to conform with proper grammatical and idiomatic English. None of the amendments herein are made for reasons related to patentability. No new matter has been added.

Attached hereto is a marked-up version of the changes made to the specification by the current amendment. The attached page is captioned "Version with markings to show changes made".

In the event that the transmittal letter is separated from this document and the Patent Office determines that an extension and/or other relief is required, applicant petitions for any required relief including extensions of time and authorizes the Commissioner to charge the cost of such petitions and/or other fees due in connection with the filing of this document to Deposit Account No. 03-1952 referencing docket no. 449122002000. However, the Commissioner is not authorized to charge the cost of the issue fee to the Deposit Account.

Respectfully submitted,

Dated: March 29, 2001

By: 

Kevin R. Spivak
Registration No. 43,148

Morrison & Foerster LLP
2000 Pennsylvania Avenue, N.W.
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Telephone: (202) 887-6924
Facsimile: (202) 887-0763

VERSION WITH MARKINGS TO SHOW CHANGES MADE

In the Specification:

Page 1 before the first paragraph, has been amended to include the following insert:

This application claims priority to International Application No. PCT/EP99/04626 which was published in the German language on February 17, 2000.

11/11/2000 11:11:11

Description

Method for operating a terminal unit in an exchange by means of a message interface between signaling and control programs, and terminal units used in the method

The invention relates to a method for operating a terminal unit in an exchange, in which switching operations are carried out during execution of application programs. Signaling for a first subscriber, for example, is such a switching operation. Further switching operations relate to call processing when setting up and clearing down a connection between the first subscriber and a second subscriber. The flow of the application programs is controlled by an operating system which serves as linking element between application programs and electronic components of the computer. The operating system controls various operating functions of the computer and takes over essential tasks such as, for example, memory management and driving the equipment.

The invention also relates to a method for operating a terminal unit in an exchange, in which signaling is carried out with the aid of a further exchange, and call processing is carried out during execution of application programs. The invention also relates to terminal units for carrying out the method.

One application program used to date executes both signaling and call processing. Signaling data and call data are processed in this case. Because of its size, the application program used to date for signaling and call processing is very involved. This results in a higher outlay on producing and maintaining the application program. Moreover, to date a dedicated application program has been used for each communications protocol which can occur on a subscriber

line or during interexchange signaling. This likewise complicates producing and maintaining the application programs.

It is an object of the invention to specify
5 methods for operating an exchange in the case of which use is made of application programs which can be produced and maintained in a simple way. Terminal units suitable for executing the method are also to be specified.

10 This object is achieved for methods by the method steps specified in patent claims 1 and/or 2. Developments are specified in the subclaims.

The invention proceeds from the finding that signaling and call processing are two functions of the
15 exchange which are to be clearly distinguished from one another. Such different functions can be executed in different application programs. Separating the common application program used to date for signaling and for setting up a connection into two application programs
20 is complicated by the fact that signaling and call processing form a uniform status-controlled and event-controlled process. This means that statuses are established which are run through according to a prescribed sequence as a function of switching events.
25 Steps for signaling and steps for call processing are contained in this sequence, in which case there is usually repeated changing between steps for signaling and steps for call processing.

A first application program for signaling (LIP
30 - line processing) and a second application program for call processing (CAP) are used in the method according to the invention. A message interface renders it possible for the two application programs to implement a uniform

status-controlled and event-controlled method. Stipulations concerning the structure of the data to be transmitted, as well as stipulations concerning the manner of the transfer belong to the message interface.

5 The transfer of the associated data is performed by using the operating system. As a result of this measure, by contrast with a subroutine call of the same application program, it is possible to generate a further message, there being no need for the preceding
10 message to have been already processed by the other application program.

The message interface permits the application programs to be modularized by function. As a result, the application programs are transparent and are
15 therefore easy to develop and maintain.

It is possible, furthermore, to produce an application program in each case in relation to the various signaling protocols by means of the method according to the invention. The interface is defined
20 such that an application program for call processing can cooperate with the various application programs for signaling. This measure gives rise to savings in storage space as soon as two or more protocols for signaling are used in the exchange and if, when
25 processing the second application programs, use is made of the same command sequence as explained below with the aid of the exemplary embodiments. Conversely, it is also possible for an application program for signaling to cooperate with various application programs for call
30 processing, such as in the case of the features of "tripartite conference" or "call waiting".

The invention also relates to terminal units for an exchange. The methods according to the invention are carried out with the aid of these terminal units.
35 The abovenamed technical effects therefore also apply to the terminal units.

Exemplary embodiments of the invention are explained below with the aid of the attached drawings, in which:

- Figure 1 shows an exchange with a plurality of terminal units,
- Figure 2 shows a terminal unit with a plurality of interface modules,
- Figure 3 shows an illustration of the run procedures in the terminal unit, and
- Figure 4 shows a message block with an associated data block.

Figure 1 shows in a telecommunications network 8 an exchange 10, also abbreviated as VSt, with a plurality of terminal units 12 to 16 whose structure is explained with the aid of the terminal unit 12 in figure 2. Further terminal units arranged between the terminal units 12 and 14 are indicated by dots.

A connecting line 18 connects the terminal unit 12 to a concentrator unit 20 to which a multiplicity of subscribers are connected, of which a subscriber T1n1 is illustrated in figure 1. The concentrator unit 20 on the one hand groups the lines coming from the subscribers such that only one line 18 need be used to transmit the voice data to the exchange 10. On the other hand, the concentrator unit 20 distributes the voice data received via the line 18 among the subscriber lines of the subscribers. A PCM30 system (PCM = Pulse Code Modulation) is used on the connecting line 18, that is to say 30 voice channels are available. The transmission of the PCM voice data is performed using a first protocol P1, which is a SIEMENS-internal protocol. However, standardized protocols are also used as protocol P1, for example the protocols

MULDEX, V51 or V52. A plurality of PCM30 systems, or else PCM24 systems with 24 voice channels can also be used on the connecting line 18.

5 A connecting line 22 connects the interface
module 14 to a telecommunications system 24. The
telecommunications system 24 allows, for example, a
company to switch internal communications traffic
inside its private premises, and/or to set up
connections to the outside. One of the subscribers
10 connected to the telecommunications system 24 is
illustrated in figure 1 as subscriber Tln2. The
transmission of the voice data is performed between the
telecommunications system 24 and the terminal unit 14
in accordance with a protocol P2, which differs from
15 the protocol P1.

The terminal unit 16 is connected to a further
exchange 26 via a connecting line 28. The transmission
of voice and signaling data on the connecting line 28
is performed in accordance with a protocol P3, which
20 was selected from protocols which are designed
specifically for connecting two exchanges. A connection
of the subscriber Tln1 to a subscriber Tln3 connected
to the exchange 26 is set up by means of the terminal
unit 16.

25 The exchange 10 also contains a main switching
matrix 30 and a central processor 32. All the terminal
units 12 to 16 are connected to the switching matrix 30
via connecting lines 34 to 38. Each connecting line 34
to 38 has a transmission capacity of eight Mbits per
30 second, and so voice or control data can respectively
be transmitted via 128 transmission channels. The
central processor 32 controls the switching of
connections in the switching matrix 30. For example,
the central processor 32 switches a voice channel 40
35 via which the subscriber Tln1 can speak with the
subscriber Tln2. A message channel 42 is used in
advance by the terminal unit 12 in order to inform the
central processor 32

that the subscriber Tln1 would like to set up a connection to the subscriber Tln2. After the call has been switched through, further control data are exchanged between the terminal units 12 to 16 and the
5 central processor via the message channel 40 or via message channels 42', 42''.

The terminal unit 16 illustrated in figure 1 is used to signal between the exchanges 10 and 26. Also present in the terminal unit 16 are signaling programs
10 and subscriber connection programs which exchange data via a message interface.

Figure 2 shows the structure of the terminal unit 12, in which there are contained four interface modules of which two interface modules 50 and 52 are
15 illustrated in figure 2. The connecting line 18 is connected to the interface module 50. The interface module 50 is capable of operating in accordance with protocol P1.

Connected to the interface module 52 is a line
20 54 which leads to a further telecommunications system (not illustrated). The protocol used for transmission via the connecting line 54 is the protocol P2. The interface module 52 is capable of operating in accordance with protocol P2 for telecommunications
25 systems.

The terminal unit 12 also contains a group switching matrix 56 and a group processor 58. The interface modules 50 to 52 are connected to the group switching matrix 56 via connecting lines 60 to 62, such
30 that connections can be switched in the group switching matrix 56 between the terminal units 50 to 52 and an interface 64. The interface 64 is connected via a connecting line 66 to the group switching matrix 56, and via a connecting line 68 to the group processor 58.
35 The connecting line 34 is connected on the other side of the interface 64.

The connection 40, illustrated in figure 1, from the subscriber Tln1 to subscriber Tln2 is switched by using a connection 70 in the switching matrix 56. The transmission channel for connecting from subscriber Tln1 to subscriber Tln2 is therefore switched via the connecting line 18, the interface module 50, the connecting line 60, the connection 70, the connecting line 66, the interface 64 and the connecting line 34.

The interface modules 50 to 52 are connected to the group processor 58 via a bus system 72. The group processor 58 can control the switching of connections in the group switching matrix 56 via the bus system 72.

The terminal unit 12 also contains a signal unit 74 which contains, inter alia, a tone generator, a ringing current generator, a metering pulse generator and a dual tone multifrequency (DTMF) receiver. The signal unit 74 is connected via connections (not illustrated) to the interface modules 50, 52, the group switching matrix 56 and to the group processor 58.

Moreover, the terminal unit 12 contains a memory unit 76 which is connected to the group processor 58 via a bus 78. Stored in the memory unit 76 are programs upon the processing of which by the group processor 58 signaling and call processing are implemented.

Figure 3 shows run procedures occurring in the terminal unit 12. The circuits, for example the interface modules 50, 52 or the interface 64, contained in the terminal unit 12 are driven during processing of the commands of an operating system BS, likewise stored in the memory 76, by the group processor 58. The operating system BS is therefore the linking element between the circuit components in the terminal unit 12 and so-called application programs

during the processing of which the terminal unit 12 executes switching functions. Of these application programs, figure 3 shows signaling programs 100 to 104 and subscriber connection programs 110 to 114.

5 The signaling program 100 is used for a connection which sets up a subscriber TlnA1 connected on the line 18 to a subscriber TlnB1. The signaling on the interface module 50 is carried out during processing of the signaling program 100, and so voice
10 data and signaling data are transmitted in accordance with protocol P1. The subscriber connection program 110 is also used to connect the subscriber TlnA1 to the subscriber TlnB1. The call processing is executed during processing of the subscriber connection program
15 110, that is to say the setting up of a connection, the switching-through of the group switching matrix etc., as well as the call clear-down. Data are exchanged between the signaling program 100 and the subscriber connection program 110 exclusively via a message
20 interface 120. Both the signaling program 100 and the subscriber connection program 110 operate using the status-event principle. This means that statuses are established in which specific external events are defined which, in turn, result in other statuses. An
25 example for this status-event principle will be explained further below. The operating system BS is used for the purpose of data exchange via the message interface 120 so that the signaling program 100 and the subscriber connection program 110 can also operate
30 between one another using the status-event principle.

 If, for example, data are transmitted by the signaling program 100 via the message interface 120 to the subscriber connection program 110, the signaling program generates a message block which, as further
35 explained below with the aid of figure 4, is stored in a previously established memory area in the memory 76 of the terminal unit 12, compare arrow 122. Consequently, the signaling

program 100 informs the operating system BS of the generation of the message block, compare arrow 124. The operating system controls the flow of the application programs 100 to 114. The operating system BS detects from the message indicated by the arrow 124 that the signaling program 100 has generated a message block for the subscriber connection program 110. As a result, the operating system BS then causes the subscriber connection program 110 to be processed, compare arrow 126. The message block stored in the memory is read during processing of the subscriber connection program 110, compare arrow 128. The message contained in the message block is processed by the subscriber connection program 110. Thereafter, a prescribed status is reached again during processing of the subscriber connection program 110. Subscriber connection program 110 then awaits a new event. This event comes, for example, from the subscriber TlnB1, whereupon the operating system BS again causes the subscriber connection program 110 to be executed.

The message interface 120 is also used if there are messages or data to be transferred to the signaling program 100 during processing of the subscriber connection program 110. Use is made again for this purpose of a message block which is stored in the memory, compare arrow 130. Thereafter, the subscriber connection program 110 informs the operating system BS of the generation of the message block, compare arrow 132. The operating system BS causes the associated signaling program 100 to be restarted, compare arrow 134. The message block generated by the subscriber connection program 110 is then read during processing of the signaling program 134, compare arrow 136. The structure of a message block is explained more precisely with the aid of figure 4 further below.

In the example according to figure 3, a further connection is activated between a subscriber TlnA2 connected to the interface module 52 and a subscriber TlnB2 by the subscriber TlnA2. In the case of the

connection between the subscriber TlnA2 and the subscriber TlnB2, a signaling program

102 is used for signaling in accordance with the protocol P2. The interface module 52 is driven during processing of this signaling program 102. The signaling programs 100 and 102 are thereby distinguished, because
5 they drive circuit components which generate signals in accordance with different protocols P1 and P2.

Moreover, the subscriber connection program 112 for call processing is used to connect the subscribers TlnA2 and TlnB2. Call processing is independent of the
10 signaling protocol P1 or P2 that is used, and so the same subscriber connection program is used for the connections 110 and 112.

The message interface 120 is used again during the exchange of messages between the signaling program
15 102 and the associated subscriber connection program 112, compare arrows 138 to 144. The exchange of message blocks is performed during processing of the signaling program 102 or the subscriber connection program 112 in the same way as above for the signaling program 100 and
20 the subscriber connection program 110. Although not illustrated in figure 3, the operating system BS is also incorporated during the exchange of message blocks between the signaling program 102 and the subscriber connection program 112.

Also illustrated in figure 3 is a connection
25 between a subscriber TlnA3 and a subscriber TlnB3, which has been activated by the subscriber TlnA3 at the exchange 26, compare figure 1, the subscriber TlnB3 being connected to the concentrator unit 20. The
30 signaling program 104 and the subscriber connection program 114 are used to connect the subscribers TlnA3 and TlnB3. The subscriber connection program 114 differs from the subscriber connection program 110 or 112, because call processing on the called B side is to
35 be carried out differently than the signaling on the calling A side. The signaling program 104, by contrast,

contains the same command sequences as the signaling program 100, because both signaling programs 100 and 104 operate according to the same protocol P1, and the protocol P1 is a so-called two-way protocol which operates in the direction of the calling A subscriber, exactly as it does in the direction of the called B subscriber. The message interface 120 is used during the exchange of message blocks between the subscriber connection program 104 and the signaling program 114, compare arrows 146 to 152, the operating system BS being incorporated.

In the case of another exemplary embodiment (not illustrated), there is only a single command sequence for the subscriber connection programs 110 and 112 in the memory of the terminal unit 12. Each subscriber connection program 110 or 112 is assigned an imaginary interface to which interface data belong. It is noted in the interface data which subscriber connection program 110 or 112 belongs to the respective interface. Moreover, the respective last status in the interface data is noted by the subscriber connection program 110 or 112 belonging to the respective interface. When processing the command sequence common to the subscriber connection programs 110 and 112, it is known which subscriber connection program 110 or 112 is currently to be processed. The interface data belonging to this subscriber connection program 110 or 112 can be used to establish the last processing status, and processing can be continued in this status. Procedure is similar when a plurality of signaling programs 100, 102 and 104 of the same protocol P1 or P2 and on the same connecting side are to be executed.

Figure 4 shows an example of a message block 200 and an associated data block 202, which are stored in a memory 204 of the interface group 12. The message block 200 contains a receiver address field 206, a data address field 208, a message identification field 210, a transmitter identification field 212 and a transmitter address field 214. The address of the

signaling program 100 to 104 or, respectively, of the subscriber connection program 110 to 114 is stored in the receiver address field 206, for which the message block 200 is intended. The operating system BS uses the receiver address in the receiver address field 206 to determine the application program 100 to 114 which is intended to process the message block 200.

The address of a first data field 220 of the data block 202 is contained in the data address field 208. It is possible to access the data block 202 with the aid of the data address 208 during processing of the message block 200, compare arrow 216.

The type of message contained in the message block 200 is specified in the message identification field 210. The processing of the message block 200 can thereby be carried out by the type of message.

The identifier of the application program 100 to 114 which has generated the message block 200 is noted in the transmitter identification field 212. The address of the application program 100 to 114 which has generated the message block 200 is noted in the transmitter address field 214. The data fields 212 and 214 are, if appropriate, evaluated during processing of the message block 200.

In addition to the first data field 220, the data block 202 contains further data fields 222, 224 etc., in which data to be transmitted are stored. The address of that application program 100 to 114 which has generated the data block 202 is stored in the data field 220 as well as in the data field 214.

In another exemplary embodiment (not illustrated), other or additional data fields are present in the message block 200 and/or in the data block 202.

Patent claims

1. A method for operating a terminal unit (12) in an exchange (10),
- 5 in which signaling for a first subscriber (TlnA1) is carried out during execution of a first application program (100) by a processor (58) contained in the terminal unit (12),
- method steps for call processing between the first
- 10 subscriber (TlnA1) and a second subscriber (TlnB1) are carried out during execution of a second application program (110),
- signaling data (200), generated during signaling, at a message interface (120) are transferred to the second
- 15 application program (110) by using an operating system (BS) for controlling the flow of the application programs (100, 110),
- and/or in which call data, generated during call processing (110), at the message interface (120) are
- 20 transferred to the first application program (100) by using the operating system (BS).
2. A method for operating a terminal unit (16) in an exchange (10),
- in which signaling is carried out with the aid of a
- 25 further exchange (26) by a processor contained in the terminal unit (16) during execution of a first application program,
- method steps for call processing between the two exchanges (10, 26) are carried out during execution of
- 30 a second application program,
- signaling data (200), generated during signaling, at a message interface are transferred to the second application program by using an operating system (BS) for controlling the flow of the application programs,

and/or in which call data, generated during call processing, at the message interface are transferred to the first application program by using the operating system (BS).

5 3. The method as claimed in claim 1 or 2, characterized in that the generated signaling data (200) and/or the call data contain messages with a prescribed structure.

10 4. The method as claimed in claim 3, characterized in that the messages contain a receiver identifier (206),
and/or an address reference (208) on a data block (202) with data to be transmitted,
and/or a message identifier (210) for distinguishing
15 the different messages,
and/or a message type identifier for identifying the type of message,
and/or data (212, 214) on the application program (100, 110) generating the message.

20 5. The method as claimed in one of the preceding claims, characterized in that the signaling data (200) and/or the call data contain a data block (202),
and in that, in addition to data (222, 224) to be transmitted, the data block preferably contains further
25 data (220) with the aid of which the data block (202) can be assigned to one or more application programs (100, 110).

30 6. The method as claimed in one of the preceding claims, characterized in that at least two first application programs (100, 102) are used for signaling with the aid of different protocols (P1, P2),
and in that the first application programs exchange signaling data (200) and/or call data with second application programs (110, 112) via a common or

a plurality of message interfaces (120),
and in that the same command sequence is preferably
executed during processing of the second application
programs.

5 7. The method as claimed in one of claims 1 to 5,
characterized in that at least two second application
programs with identical or different command sequences
are used,

10 in that the first application program exchanges
signaling data and/or call data with the second
application programs via a common or a plurality of
message interfaces,

15 and in that the same command sequence is preferably
used in the case of second application programs with
identical command sequences.

8. A terminal unit (12) for an exchange (10), in
particular for carrying out the method as claimed in
claim 1 or one of claims 1 to 7,

20 having at least one subscriber line (50) for connecting
a first subscriber (TlnA1),

having at least one further connection (64) for setting
up a transmission channel to a second subscriber
(TlnB1),

25 having application programs (100) to (114) for
executing switching operations, to which signaling at
the subscriber line (50) and method steps for call
processing belong,

30 use being made of signaling data (200) generated during
signaling when processing a call, and or call data
generated during call processing when signaling,

and having an operating system (BS) controlling the
flow of the application programs (100 to 114),
characterized in that the signaling data (200) and/or
the call data are transferred to at least one

message interface (120) by using the operating system (BS).

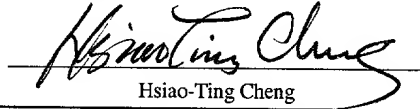
9. The terminal unit (16) for an exchange (10), in particular for carrying out the method as claimed in one of claims 2 to 7, having at least one connection for connecting a further exchange (26), having application programs for executing switching operations, to which signaling at the connection and method steps for call processing belong, use being made of signaling data (200) generated during signaling when processing a call, and or call data generated during call processing when signaling, and having an operating system (BS) controlling the flow of the application programs, characterized in that the signaling data (200) and/or the call data are transferred to at least one message interface by using the operating system (BS).
10. The terminal unit (12, 16) as claimed in claim 8 or 9, characterized in that signaling is executed by a first application program (100), and the method steps for call processing are executed by a second application program (110).
11. An exchange (10), characterized by a terminal unit (12, 16) as claimed in one of claims 8 to 10.

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PATENT
Docket No. 449122002000
Client Reference 1998P02267WOUS

CERTIFICATE OF HAND DELIVERY

I hereby certify that this correspondence is being hand filed with the United States Patent and Trademark Office in Washington, D.C. on March 29, 2001.


Hsiao-Ting Cheng

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In the application of:

Michael EDER et al.

Serial No.: 09/762,472

Filing Date: February 7, 2001

For: METHOD FOR OPERATING A
TERMINAL UNIT IN A TELEPHONE
EXCHANGE

Examiner: To be Assigned

Group Art Unit: To be Assigned

AMENDMENT OF DRAWING UNDER 37 CFR SECTION 1.121

Commissioner for Patents
Washington, D.C. 20231

Sir:

This Amendment is submitted in order to provide translation in Figures 2-4 of the above-referenced application. Submitted herewith are copies of the Figures 2-4 as filed with the proposed changes made in red ink.

Formal drawings will be submitted upon notification of allowable subject matter.

In the event that the transmittal letter is separated from this document and the Patent Office determines that an extension and/or other relief is required, applicant petitions for any required relief including extensions of time and authorizes the Commissioner to charge the cost of such petitions and/or other fees due in connection with the filing of this amendment to our

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[illegible]

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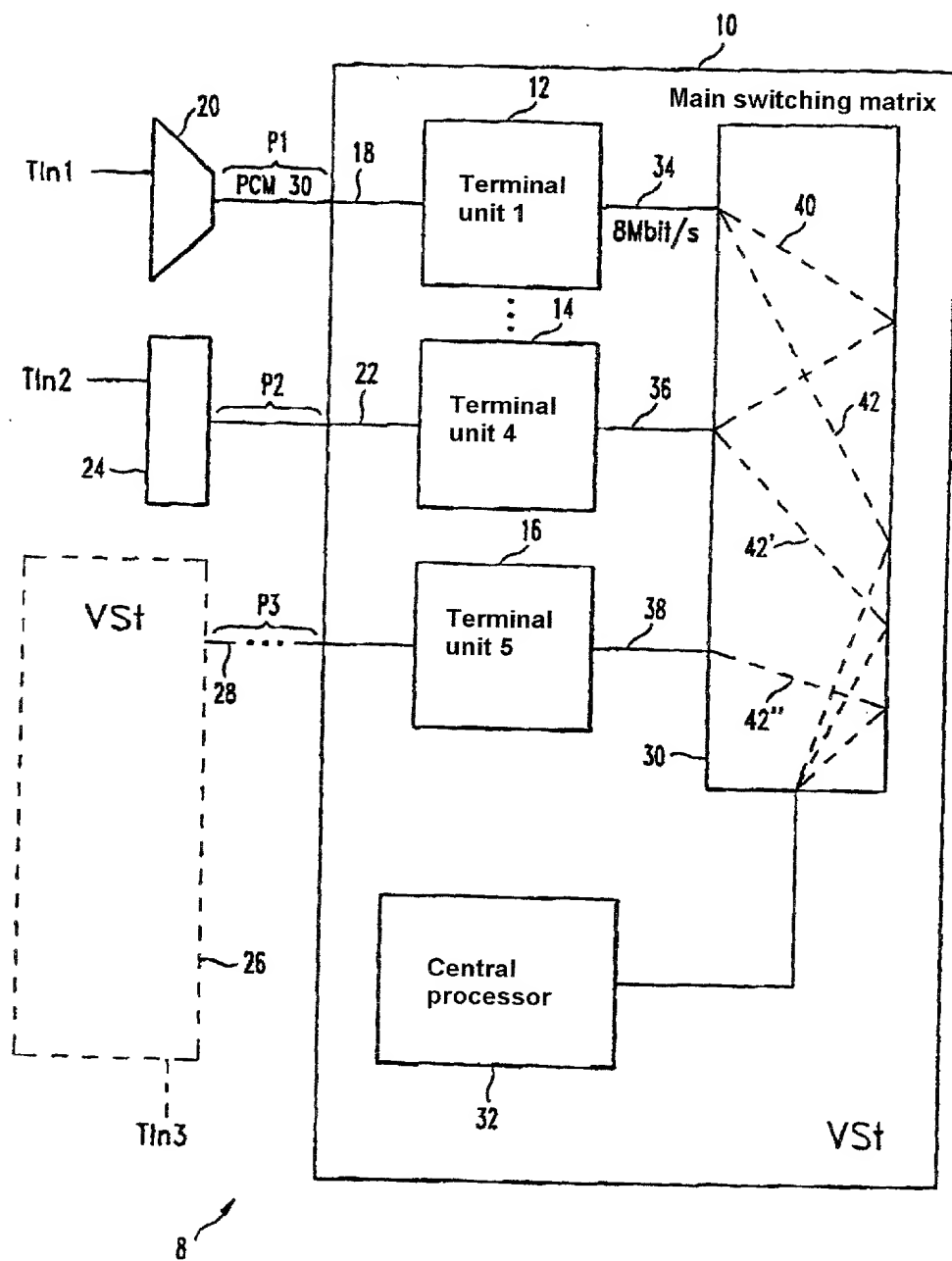
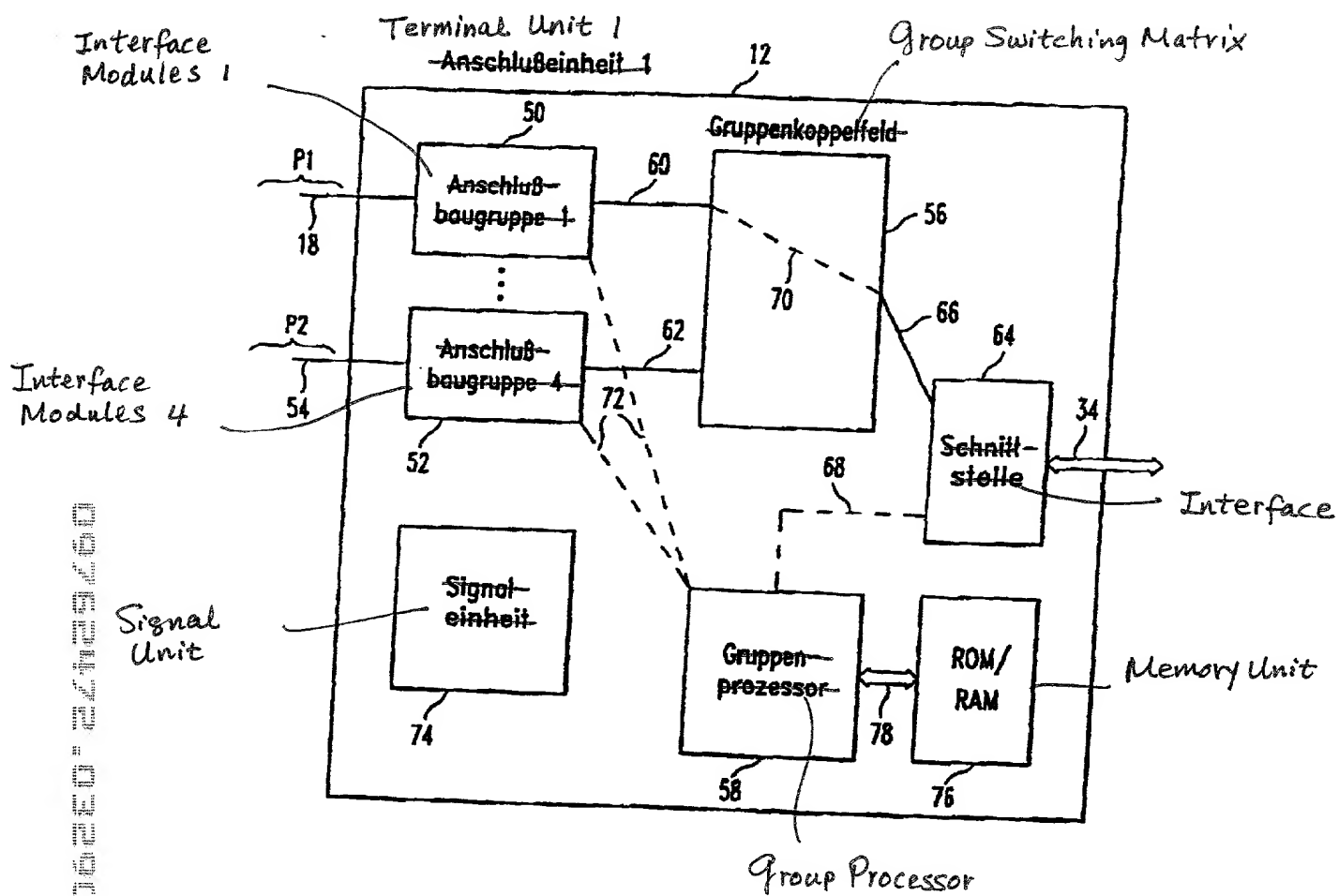


Fig.1



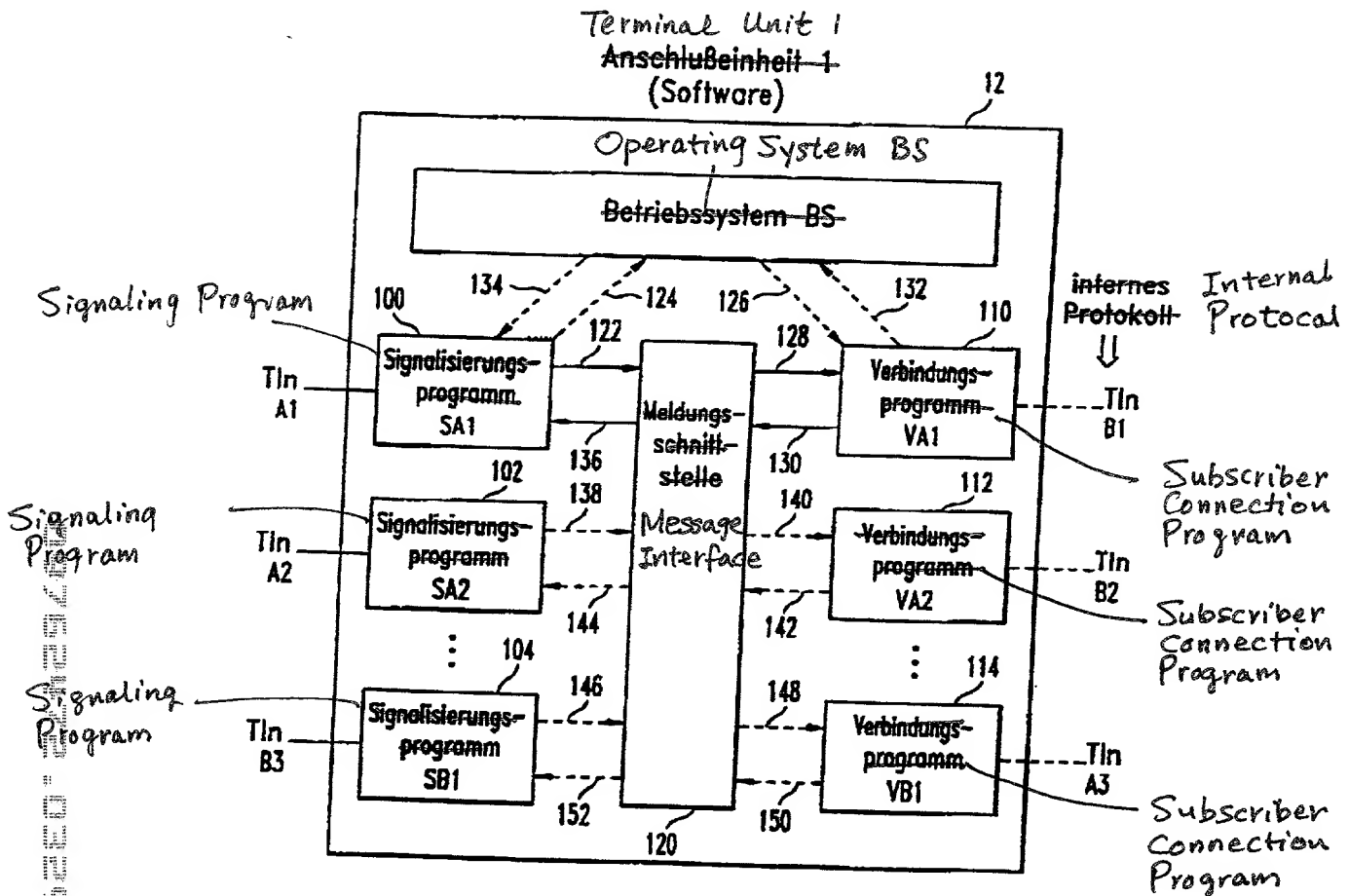


Fig.3

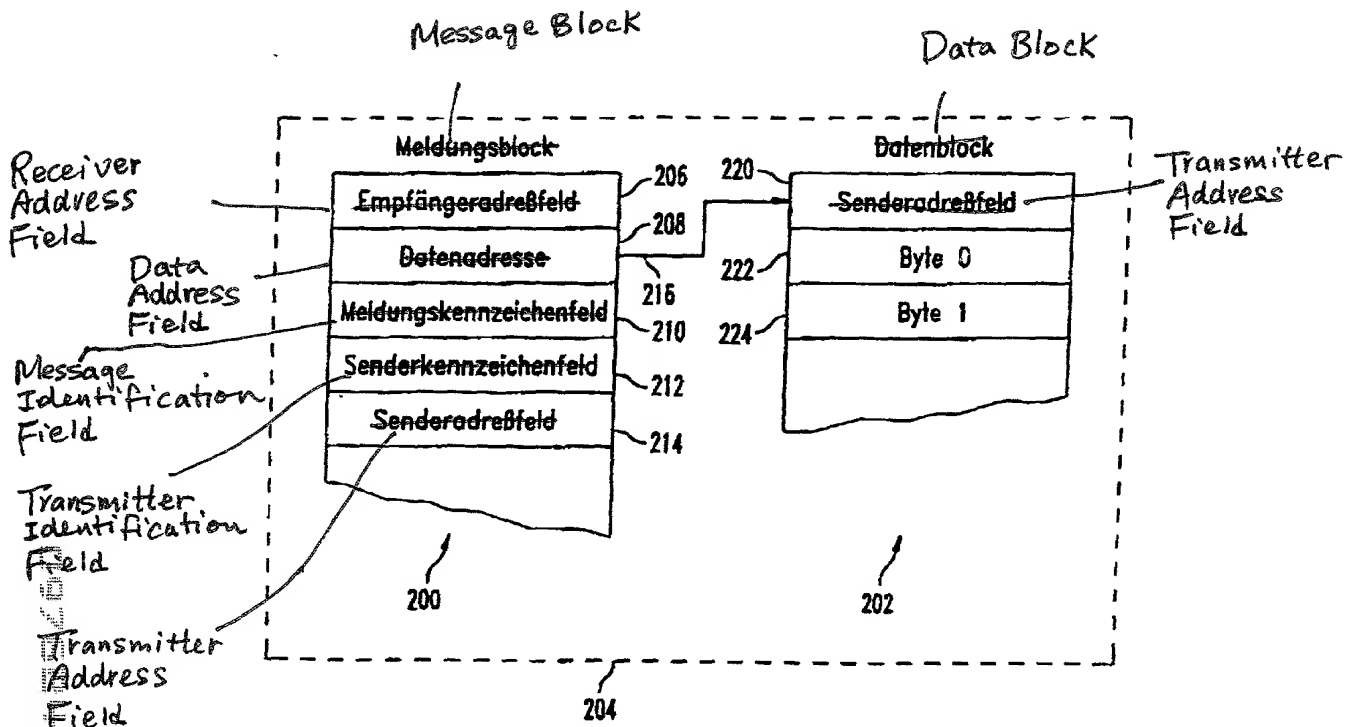


Fig. 4

Declaration and Power of Attorney For Patent Application

Erklärung Für Patentanmeldungen Mit Vollmacht

German Language Declaration

Als nachstehend benannter Erfinder erkläre ich hiermit an Eides Statt:

dass mein Wohnsitz, meine Postanschrift, und meine Staatsangehörigkeit den im Nachstehenden nach meinem Namen aufgeführten Angaben entsprechen,

dass ich, nach bestem Wissen der ursprüngliche, erste und alleinige Erfinder (falls nachstehend nur ein Name angegeben ist) oder ein ursprünglicher, erster und Miterfinder (falls nachstehend mehrere Namen aufgeführt sind) des Gegenstandes bin, für den dieser Antrag gestellt wird und für den ein Patent beantragt wird für die Erfindung mit dem Titel:

Verfahren zum Betreiben einer
Anschlusseinheit in einer Vermittlungsstelle

deren Beschreibung

(zutreffendes ankreuzen)

☐ hier beigelegt ist.

☒ am 2. Juli 1999 als

PCT internationale Anmeldung:

PCT Anmeldungsnummer PCT/EP99/04626

eingereicht wurde und am _____

abgeändert wurde (falls tatsächlich abgeändert).

Ich bestätige hiermit, dass ich den Inhalt der obigen Patentanmeldung einschliesslich der Ansprüche durchgesehen und verstanden habe, die eventuell durch einen Zusatzantrag wie oben erwähnt abgeändert wurde.

Ich erkenne meine Pflicht zur Offenbarung irgendwelcher Informationen, die für die Prüfung der vorliegenden Anmeldung in Einklang mit Absatz 37, Bundesgesetzbuch, Paragraph 1.56(a) von Wichtigkeit sind, an.

Ich beanspruche hiermit ausländische Prioritätsvorteile gemäss Abschnitt 35 der Zivilprozessordnung der Vereinigten Staaten, Paragraph 119 aller unten angegebenen Auslandsanmeldungen für ein Patent oder eine Erfindersurkunde, und habe auch alle Auslandsanmeldungen für ein Patent oder eine Erfindersurkunde nachstehend gekennzeichnet, die ein Anmeldedatum haben, das vor dem Anmeldedatum der Anmeldung liegt, für die Priorität beansprucht wird.

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name,

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled

the specification of which

(check one)

☐ is attached hereto.

☐ was filed on _____ as

PCT international application

PCT Application No.

and was amended on

(if applicable)

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to the examination of this application in accordance with Title 37, Code of Federal Regulations, §1.56(a).

I hereby claim foreign priority benefits under Title 35, United States Code, §119 of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate having a filing date before that of the application on which priority is claimed:

Declaration and Power of Attorney For Patent Application

Erklärung Für Patentanmeldungen Mit Vollmacht

German Language Declaration

Als nachstehend benannter Erfinder erkläre ich hiermit an Eides Statt:

dass mein Wohnsitz, meine Postanschrift, und meine Staatsangehörigkeit den im Nachstehenden nach meinem Namen aufgeführten Angaben entsprechen,

dass ich, nach bestem Wissen der ursprüngliche, erste und alleinige Erfinder (falls nachstehend nur ein Name angegeben ist) oder ein ursprünglicher, erster und Miterfinder (falls nachstehend mehrere Namen aufgeführt sind) des Gegenstandes bin, für den dieser Antrag gestellt wird und für den ein Patent beantragt wird für die Erfindung mit dem Titel:

Verfahren zum Betreiben einer
Anschlusseinheit in einer Vermittlungsstelle

deren Beschreibung

(zutreffendes ankreuzen)

☒ hier beigefügt ist.

☐ am _____ als

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Ich bestätige hiermit, dass ich den Inhalt der obige ☐ Patentanmeldung einschliesslich der Ansprüche durchgesehen und verstanden habe, die eventuell durch einen Zusatzantrag wie oben erwähnt abgeändert wurde.

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Ich beanspruche hiermit ausländische Prioritätsvorteile gemäss Abschnitt 35 der Zivilprozessordnung der Vereinigten Staaten, Paragraph 119 aller unten angegebenen Auslandsanmeldungen für ein Patent oder eine Erfindersurkunde, und habe auch alle Auslandsanmeldungen für ein Patent oder eine Erfindersurkunde nachstehend gekennzeichnet, die ein Anmeldedatum haben, das vor dem Anmeldedatum der Anmeldung liegt, für die Priorität beansprucht wird.

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name,

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled

the specification of which

(check one)

☐ is attached hereto.

☐ was filed on _____ as

PCT international application

PCT Application No. _____

and was amended on _____

(if applicable)

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to the examination of this application in accordance with Title 37, Code of Federal Regulations, §1.56(a).

I hereby claim foreign priority benefits under Title 35, United States Code, §119 of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate having a filing date before that of the application on which priority is claimed:

| 項目 | 単位 | 数値 | 単位 | 数値 |
|------|------------|-----------|------|------------|
| 総人口 | 人 | 1,234,567 | 総人口 | 人 |
| 男性人口 | 人 | 612,345 | 女性人口 | 人 |
| 女性人口 | 人 | 622,222 | 出生人口 | 人 |
| 出生人口 | 人 | 12,345 | 死亡人口 | 人 |
| 死亡人口 | 人 | 8,765 | 自然増減 | 人 |
| 自然増減 | 人 | 3,580 | 人口密度 | 人/平方キロメートル |
| 人口密度 | 人/平方キロメートル | 123.45 | 労働人口 | 人 |
| 労働人口 | 人 | 567,890 | 失業率 | % |
| 失業率 | % | 5.67 | 平均年齢 | 歳 |
| 平均年齢 | 歳 | 34.56 | 識字率 | % |
| 識字率 | % | 98.76 | 医師数 | 人 |
| 医師数 | 人 | 123 | 看護師数 | 人 |
| 看護師数 | 人 | 456 | 警察官数 | 人 |
| 警察官数 | 人 | 789 | 消防員数 | 人 |
| 消防員数 | 人 | 101 | 議員数 | 人 |
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| 議員数 | 人 | 234 | 議員数 | 人 |
| 議員数 | 人 | 567 | 議員数 | 人 |
| 議員数 | 人 | 890 | 議員数 | 人 |
| 議員数 | 人 | 123 | 議員数 | 人 |
| 議員数 | 人 | 456 | 議員数 | 人 |
| 議員数 | 人 | 789 | 議員数 | 人 |
| 議員数 | 人 | 101 | 議員数 | 人 |
| 議員数 | 人 | 234 | 議員数 | 人 |
| 議員数 | 人 | 567 | 議員数 | |

Priority Claimed

| | |
|-------------------------------------|--------------------------|
| <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| Yes | No |
| Ja | Nein |

☐ Yes
Ja

☐ No
Nein

☐ Yes
☐ No
Ja Nein

I hereby claim the benefit under Title 35, United States Code, §120 of any United States application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of Title 35, United States Code, §122, I acknowledge the duty to disclose material information as defined in Title 37, Code of Federal Regulations, §1.56(a) which occurred between the filing date of the prior application and the national or PCT international filing date of this application.

| | |
|---------------------------------------|-----------------------------------|
| (Status) | (Status) |
| (patentiert, anhangig, aufgegeben) | (patented, pending, abandoned) |

| | |
|-------------------------------------|-----------------------------------|
| (Status) | (Status) |
| (patentiert, anhängig, aufgeben) | (patented, pending, abandoned) |

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true, and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

German Language Declaration

VERTRETUNGSVOLLMACHT: Als benannter Erfinder beauftrage ich hiermit den nachstehend benannten Patentanwalt (oder die nachstehend benannten Patentanwälte) und/oder Patent-Agenten mit der Verfolgung der vorliegenden Patentanmeldung sowie mit der Abwicklung aller damit verbundenen Geschäfte vor dem Patent- und Warenzeichenamt: (Name und Registrationsnummer anführen)

POWER OF ATTORNEY: As a named inventor, I hereby appoint the following attorney(s) and/or agent(s) to prosecute this application and transact all business in the Patent and Trademark Office connected therewith. (list name and registration number)

And I hereby appoint

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